non-binomial generic names, leaving *Amia* instead of *Amiatus* for the bowfin, but I follow the decisions of my colleagues. We can not use the same name for two genera. The list of genera, the retention of which is desired as printed in SCIENCE, contains 38 names, the changing of most of which has been unpleasant to taxonomists as well as to others. But these 38 we would like to keep are very few among the thousands of generic names which only a recognition of the law of priority and of some law for fixing the type of incongruous genera can hope to regulate.

The second proposed rule is this:

The transfer of generic or specific names from one genus or species to another shall not be allowed when this will lead to lasting confusion or error.

This reads fairly, but it is not possible to give it definite application. Some names occur so frequently in literature that they may be said to be definitely fixed. Most names the world over have only a tentative status. The fauna of the world is very large, and we are only at the beginning of our knowledge of it. The fauna of western Europe, to which many of the 38 names belong, is only a minute fragment of it. The main source of confusion and error is, however, in leaving a name where it does not belong, after its right place or right usage has been made clear. But if this rule could be lucidly framed so as to permit regularity of application, it has its merits.

The third proposition, the rejection of certain authors on their merits as non-binomial, has its advantages. The non-binomial writings of Brisson and Gronow have been accepted by the commission. A non-binomial condensed reprint of Klein has been rejected. Either view of the case, if generally followed, leads to stability. Before the ruling of the commission Brisson's names were accepted by a majority, those of Gronow, on the same footing, by a minority. The commission has voted to accept both. The matter is likely to come up again at the Monaco meeting.

The fourth proposition, the rejection of non-scientific catalogues, newspapers and the like, might be reasonable if it could be properly defined.

The vital thing is the recognition of law as superior to personal preference or temporary convenience. The "deplorable results" of adherence to the rigid rule of priority are as a drop in the bucket compared to the "deplorable results" that have followed the go-as-you-please acceptance, rejection or change of generic and specific names. And this latter form of "deplorable results" does not trouble the non-systematist who uses scientific names casually as labels for his preparations or who may deal with a small part of a long-known fauna. They vex the systematist who must map out and record some broad part of the vast system of the life of the globe. In his bookkeeping he must follow the same methods throughout regardless of local usage or of personal preferences.

DAVID STARR JORDAN

THE PHYSIOLOGICAL SIGNIFICANCE OF THE SEGMENTED STRUCTURE OF STRIATED MUSCLE

TO THE EDITOR OF SCIENCE: In my article, "The Physiological Significance of the Segmented Structure of Striated Muscle," published in your issue of August 23, I make, on page 251, the following criticism of certain current hypotheses of muscular contraction:

A further disadvantage of the "swelling-hypotheses"—as contrasted with the surface-tension hypothesis—is that they offer no suggestion as to the nature of the connection between the electrical variation accompanying contraction and the contractile process itself.

Some qualification of this statement is now necessary. In Pauli's recent article, "Kolloidchemie der Muskelkontraktion" (Th. Steinkopff, 1912), which has reached me since my article was printed, an attempt is made to refer the negative variation to the formation of acid-protein compounds within the muscle-cell. Such compounds would yield on dissociation mobile anions, *e. g.*, lactate ions, and immobile or colloidal cations. On the assumption of a free permeability of the plasma-membrane to these anions, the formation of such compounds would theoretically give rise to a negative variation. But this conception appears to me insufficient to account for the entire phenomena of action and demarcation

currents. In particular, it fails to take into account the relations known to exist between the general permeability of the plasma membrane and the demarcation-current potential. Evidence from many sides shows that this potential varies with the permeability of the plasma membrane to simple crystalloid substances, decreasing as this permeability increases. All cytolytic (*i. e.*, permeability-increasing or membranolytic) substances and processes, so far as known, diminish this potential. Such facts indicate very clearly that semi-permeable membranes form a fundamental if not the chief factor in the production of the demarcation-current potential, and hence also in the production of the action-current which is evidently due to a variation in this potential. Any sufficient reversible increase in permeability would produce under these conditions a negative variation. Obviously, numerical data are required for a decision of those questions. It is not unlikely that several distinct factors are involved in the production of the action-current, and that the observed effect is an additive one. The potential of the action-current is said often to exceed that of the demarcation-current, a fact inexplicable on the simple membrane theory. But if an electrical variation due to a chemical change of the kind imagined by Pauli were superposed on one due to altered membrane-permeability, such an effect might conceivably result.

Ralph S. Lillie
Marine Biological Laboratory,
September 1, 1912

SCIENTIFIC BOOKS

Physik in graphischen Darstellungen. Von Felix Auerbach. Leipzig, B. G. Teubner. 1912. Large 8vo.

In recent years Professor Auerbach has been devoting himself, with success, to encyclopedic treatises on physics. It is not so long since he published his excellent "Kanon der Physik." But the present book is decidedly more novel in design. It will, in particular, be invaluable to teachers. It lends itself at once to the construction of lantern slides for the graphic illustration of involved points in theory. It is furthermore an aid to the setting of graphic problems in all parts of the subject. In a lecture course on light, for instance, almost all the answers to questions can be given by graphs. Such an exercise is easily corrected on the one hand, while on the other it is exceedingly difficult for the student to answer the question by mere copying. It has therefore always seemed to the writer that a similar body of questions, carried throughout the whole of physics, all of them to be answered graphically, would meet many of the difficulties now encountered in case of a lecture course. It is probable that Auerbach's book is a definite contribution in this direction and that a systematic course of questions, to be answered by drawing, may be put together by means of it.

Among the great variety of diagrams and constructions given, all of about the same importance, it will only be possible to refer to a few at random. Thus the curious representation of dimensional formulæ obtained by laying off the powers of *c, g, s,* in terms of length, breadth and thickness, is new to the writer. Graphic classification of different orders of standard magnitude in physics, as, for instance, the prominent distances, times, velocities, densities, etc., occurring in mechanics and the vast number of data in other parts of physics, are bound to be convenient for reference. Constructions relating to equipotential surfaces and lines of force are given in familiar diagrams, but the plates contain suggestive cases of graphic statics, including standard trusses. Similarly the velocity and acceleration hodographs adduced are cleverly chosen. The representation of the cylindroid, however, seems to the writer inadequate.

The subject of elastics both on its experimental and theoretical side lends itself admirably to graphic treatment, and a great variety of constructions is given, including impact, viscosity, hardness, etc. In hydrodynamics the plates abound in practical applications of the subject, in addition to the many exhibits of flow for cases of both rotational and irrotational motion. Waves are particularly well illustrated and the final develop-